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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,281	08/11/2006	Katsuhiko Makihata	061282-0209	5697
53080 7590 08/12/2008 MCDERMOTT WILL & EMERY LLP 600 13TH STREET, NW WASHINGTON, DC 20005-3096				
EXAMINER				
ELBIN, JESSE A				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/589,281

Applicant(s)

MAKIHATA ET AL.

Examiner

JESSE A. ELBIN

Art Unit

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 April 2007 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CS-100)
- Paper No(s)/Mail Date 11 August 2006
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. Figures 8-10 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
3. The drawings are objected to because the label in Figure 10 appears to contain a typo. The label of the abscissa states "Temperature History [°C] x 30 Sec" which implies temperature multiplied by a time (i.e. units of °C·s).
4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

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application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities:
- a. Page 2, line 9 says "coats". For the purposes of examination, "coats" will be interpreted as "converts".
 - b. Page 4, lines 6-7 state that "the abscissa indicates the heating temperature...and the abscissa indicates the surface potential". For the purposes of examination, "the abscissa" on line 7 will be interpreted as "the ordinate".
 - c. Page 12, line 19 says "paced". For the purposes of examination, "paced" will be interpreted as "placed".
 - d. Page 19, line 13 says "for several to several tens of hours". For the purposes of examination, "for several to several tens of hours" will be interpreted as "for several **hours** to several tens of hours".
 - e. The claims and specification commonly refer to the chemical formula SiO_2 as "silicon oxide", which is inconsistent with standard chemical nomenclature. SiO_2 shall be interpreted as "silicon dioxide."
- Appropriate correction is required.

Claim Objections

6. Claims 1, 5-6 are objected to because of the following informalities:
- a. Claim 1 states that a spacer forms a "positional relationship between said vibrating diaphragm and said fixed electrode", and "forms a space between said fixed electrode and said circuit means" implies a single spacer fulfilling both requirements. Figs. 4b and 8 illustrate two separate spacers fulfilling the two requirements. For the purposes of the art rejection below, "a spacer which forms and holds...and which forms a space..." will be interpreted as "spacers, which form and hold...and which form a space..."
 - b. Claims 5-6 state that the chemical SiO_2 is "silicon oxide", contrary to standard chemical nomenclature. For the purposes of the art rejection below, "silicon oxide" will be interpreted as "silicon dioxide". See specification objection above.
 - c. Claim 5 is dependent upon claim 3; however there is a discrepancy between claim 5, as a whole, and the specification. Claim 3 states that the dielectric layer contains PTFE. Claim 5 then states that "said dielectric layer is a silicon [di]oxide film." Page 17, lines 21-22 state that the "silicon [di]oxide film (SiO_2) is used in place of PTFE." For the purposes of the art rejection below, claim 5 will be interpreted as being dependent upon claim 1.
- Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-2, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (US PGPub 2006/0280320 ('320)) in view of Applicant's admitted prior art.

Regarding claim 1, Song teaches an electret condenser microphone ('320 title) comprising: a vibrating diaphragm ('320 #206) in which one face is electrically conductive ("the electret formed on the diaphragm 206 is called a front electret"; '320 [0021] lines 7-8); a fixed electrode (back-plate; '320 #210) which is placed to be

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opposed to said vibrating diaphragm ("facing each other"; '320 [0020] lines 6-7 and Fig. 2) via an air layer (*air layer created by spacer '320 #208*); a dielectric layer which becomes an electret for storing charges in one of said vibrating diaphragm and said fixed electrode ("either the diaphragm 206 or the back-plate 210 is formed with an electret"; '320 [0021] lines 6-7); circuit means (PCB; '320 #216) for converting an electrostatic capacity between said vibrating diaphragm and said fixed electrode to an electric signal ("a field effect transistor (FET), an embedded gain amplifier or the like...mounted on the PCB 216"; '320 [0023] lines 6-7); external connecting means (connecting terminal '320 #220) for leading out the electric signal; and spacers ('320 #208, #214) which form and hold a predetermined positional relationship between said vibrating diaphragm and said fixed electrode ('320 Fig. 2 #208), and which form a space between said fixed electrode and said circuit means ('320 Fig. 2 #214),

Song does not explicitly teach said microphone being incorporated in a metallic case while exposing only said external connecting means, wherein an outer face of said case is coated by a nonmetallic material in which a deforming temperature is higher than a charge dissipating temperature of said dielectric layer that becomes said electret.

Song does teach that a "conventional electret condenser microphone includes a case 102 made of a cylindrical metal" ('320 [0004] lines 1-3). Further, '320 Fig. 2 illustrates the case enclosing all components, except the connecting terminal. A metallic case can be used as a signal path to reduce components needed, reducing the space required.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a metallic case in the electret condenser microphone as taught by Song to reduce the components, and space required for the device.

Song further teaches materials, such as PEEK, PEN, and PES ('320 [0022] line 17) are each examples of "a high-temperature resistant material is used for components of the electret condenser microphone, so that the electret condenser microphone capable of surface mounting can be produced" ('320 [0022] lines 5-8).

Applicant admits PEEK, PEN, and PPS all have higher melting points (deforming temperature; page 14, table 1) than the temperature, at which, the surface potential is reduced by about 20% (charge dissipating temperature; page 4, lines 8-10).

While neither Song, nor Applicant explicitly teaches coating the outer face of the case with a nonmetallic material, it would have been obvious to one of ordinary skill in the art at the time of the invention to use one of the high-temperature resistant materials taught by Song as the outermost surface of the case to increase the thermal resistance of the device, while maintaining a metallic contact between the diaphragm and the circuit below (i.e. coating the metallic case with a high-thermal resistance material) for the benefit of producing an electret microphone capable of surface mounting.

Regarding claim 2, Song and Applicant's admitted prior art remain as applied above.

See rejection of claim 1 above, where Song teaches said nonmetallic material which coats said case is one of polyimide, a liquid crystal polymer, polyetherimide (PEI),

polyetheretherketone (PEEK), polyethernitrile (PEN), and polyphenylene sulfide (PPS), or a composite material containing one of the materials ("high-temperature resistant material...is exemplified by...PEEK, PEN, [and] PES"; '320 [0022] lines 15-17).

Regarding claim 7, Song and Applicant's admitted prior art remain as applied above.

See rejection of claim 1 above, where Song teaches a material of said spacer is one of polyimide, a liquid crystal polymer, polyetherimide (PEI), polyetheretherketone (PEEK), polyethernitrile (PEN), and polyphenylene sulfide (PPS), or a composite material containing one of the materials ("high-temperature resistant material...is exemplified by...PEEK, PEN, [and] PES"; '320 [0022] lines 15-17).

10. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (US PGPub 2006/0280320 ('320)) in view of Applicant's admitted prior art as applied to claim 1 above, and further in view of Cho et al. (US PGPub 2003/0113546 '546)).

Regarding claim 3, Song and Applicant's admitted prior art remain as applied above.

In the same field of endeavor, Cho teaches said dielectric layer containing polytetrafluoroethylene (PTFE) (a multi-layer electret constructed of "a poly-tetrafluoro-

ethylene...PTFE... film" ('546 [0020]) for the benefit of creating an electret with ultra-high charge stability (abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the PTFE-including electret taught by Cho in the electret condenser microphone as taught by the combination of Song and Applicant's admitted prior art for the benefit of having ultra-high charge stability.

Regarding claim 4, Song, Applicant's admitted prior art, and Cho remain as applied above.

Cho further teaches a film thickness of the polytetrafluoroethylene (PTFE) is equal to or larger than three times of a particle diameter of the PTFE (the PTFE "film 20 having high crystallinity of 30-100 μm thickness"; '546 [0020] lines 5-6), wherein "the [PTFE] resin is a mass of microscopic grains each of which has the size of 10-20 μm " ('546 [0022] lines 10-11).

11. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (US PGPub 2006/0280320 ('320)) in view of Applicant's admitted prior art as applied to claim 1 above, and further in view of Yagi et al. (US Patent 3,946,422 ('422)).

Regarding claim 5, Song and Applicant's admitted prior art remain as applied above.

In the same field of endeavor, Yagi teaches a microphone having a structure in which a dielectric layer is a silicon dioxide film ('422 Figs. 4-6 #27 and col. 3 lines 59-60), and said silicon dioxide film (SiO_2) is thoroughly coated by an insulator other than a silicon oxide film (a "combination of two layers...consists of silicon nitride and silicon dioxide"; col. 4 lines 25-28) to prevent said silicon dioxide film (SiO_2) from being exposed to an atmosphere (for the benefit of achieving a higher charge in a shorter time than a silicon dioxide layer alone; '422 col. 4 lines 22-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use an electret formed of a silicon dioxide layer, coated with silicon nitride as taught by Yagi in the electret condenser microphone taught by the combination of Song and Applicant's admitted prior art for the benefit of reducing the charging voltage and charging time of the electret.

Regarding claim 6, Song, Applicant's admitted prior art and Yagi remain as applied above.

Examiner takes official notice that forming a silicon dioxide film by a plasma CVD, or low-pressure CVD method is well known in the art. Forming films of silicon dioxide is required for production of semiconductor integrated circuits. Various methods of 'growing' silicon dioxide layers have been used, including plasma CVD and low-pressure CVD, all of which result in a film of silicon dioxide being formed on a layer of material. Further, Yagi teaches "vapor depositing a layer of...silicon dioxide" ('422 col. 4 lines 14-15) to create a precise layer thickness.

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1-7 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over at least claims 1, 4-7, and 10-12 of U.S. Patent No. 6,512,833 in view of Song et al. (US PGPub 2006/0280320 ('320)) in view of Applicant's admitted prior art as applied to claims 1, 2, and 7 above; alternately in view of Song in view of Applicant's admitted prior art in view of Cho et al. (US PGPub 2003/0113546 '546)) as applied to claims 3-4 above; alternately in view of Song in view of Applicant's admitted prior art in view of Yagi et al. (US Patent 3,946,422 ('422)) as applied to claims 5-6 above. While the claim language between the instant application and the issued patent is not identical, the differences were not found to patentably distinguish the instant application from the issued patent in view of the prior art applied above.

14. Claims 1-7 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over at least claims 1-5, and 8 of U.S. Patent No. 6,731,766 in view of Song et al. (US PGPub 2006/0280320 ('320)) in view of Applicant's admitted prior art as applied to claims 1, 2, and 7 above; alternately in view of Song in view of Applicant's admitted prior art in view of Cho et al. (US PGPub 2003/0113546 '546)) as applied to claims 3-4 above; alternately in view of Song in view of Applicant's admitted prior art in view of Yagi et al. (US Patent 3,946,422 ('422)) as applied to claims

5-6 above. While the claim language between the instant application and the issued patent is not identical, the differences were not found to patentably distinguish the instant application from the issued patent in view of the prior art applied above.

15. Claims 1-7 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over at least claims 1, 2, 7, 12-15, 18, 19, and 21 of U.S. Patent No. 6,999,596 in view of Song et al. (US PGPub 2006/0280320 ('320)) in view of Applicant's admitted prior art as applied to claims 1, 2, and 7 above; alternately in view of Song in view of Applicant's admitted prior art in view of Cho et al. (US PGPub 2003/0113546 '546)) as applied to claims 3-4 above; alternately in view of Song in view of Applicant's admitted prior art in view of Yagi et al. (US Patent 3,946,422 ('422)) as applied to claims 5-6 above. While the claim language between the instant application and the issued patent is not identical, the differences were not found to patentably distinguish the instant application from the issued patent in view of the prior art applied above.

16. Claims 1-7 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over at least claims 1-8, and 14-21 of U.S. Patent No. 7,031,480 in view of Song et al. (US PGPub 2006/0280320 ('320)) in view of Applicant's admitted prior art as applied to claims 1, 2, and 7 above; alternately in view of Song in view of Applicant's admitted prior art in view of Cho et al. (US PGPub 2003/0113546 '546)) as applied to claims 3-4 above; alternately in view of Song in view of Applicant's

admitted prior art in view of Yagi et al. (US Patent 3,946,422 ('422)) as applied to claims 5-6 above. While the claim language between the instant application and the issued patent is not identical, the differences were not found to patentably distinguish the instant application from the issued patent in view of the prior art applied above.

17. Claims 1-7 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over at least claims 18, 19, 21, 22, 24, and 28-30 of copending Application No. 10/576,518 (US PGPub 2007/0029894) in view of Song et al. (US PGPub 2006/0280320 ('320)) in view of Applicant's admitted prior art as applied to claims 1, 2, and 7 above; alternately in view of Song in view of Applicant's admitted prior art in view of Cho et al. (US PGPub 2003/0113546 '546)) as applied to claims 3-4 above; alternately in view of Song in view of Applicant's admitted prior art in view of Yagi et al. (US Patent 3,946,422 ('422)) as applied to claims 5-6 above. While the claim language between the two applications is not identical, the differences were not found to patentably distinguish the two applications in view of the prior art applied above.

This is a provisional obviousness-type double patenting rejection.

18. Claims 1-7 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over at least claims 4 and 6 of copending Application No. 11/661,355 (US PGPub 2008/0105935) in view of Song et al. (US PGPub 2006/0280320 ('320)) in view of Applicant's admitted prior art as applied to

claims 1, 2, and 7 above; alternately in view of Song in view of Applicant's admitted prior art in view of Cho et al. (US PGPub 2003/0113546 '546)) as applied to claims 3-4 above; alternately in view of Song in view of Applicant's admitted prior art in view of Yagi et al. (US Patent 3,946,422 ('422)) as applied to claims 5-6 above. While the claim language between the two applications is not identical, the differences were not found to patentably distinguish the two applications in view of the prior art applied above.

This is a provisional obviousness-type double patenting rejection.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Kawato et al. (US PGPub 2006/0188728) teaches a material for heat-resistant electret.
- b. Van Halteren et al. (US PGPub 2003/0076970) teaches an electret assembly with an improved charge stability.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSE A. ELBIN whose telephone number is (571)270-3710. The examiner can normally be reached on Monday through Friday, 8:00am to 5:00pm EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Suhan Ni can be reached on (571) 272-7505. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. A. E./
Examiner, Art Unit 2615

/Suhan Ni/
Primary Examiner, Art Unit 2614